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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,021	01/28/2002	Massimo Béchis	08719-0207	2211

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Finnegan, Henderson, Farabow,
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EXAMINER

MAYO III, WILLIAM H

ART UNIT PAPER NUMBER

2831

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

10/056,021

Applicant(s)

BECHIS ET AL.

Examiner

William H. Mayo III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's request for reconsideration of the non-rejection of the last Office action is persuasive, as the Graneau et al (Pat Num 6,354,087) doesn't constitute prior art under the statute of 35 USC 102(e) and therefore, the non-rejection is withdrawn. Please find a new detailed non final rejection below.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 21-32, 34-37, and 40-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Graneau et al (Pat Num 3,646,243, herein referred to as Graneau). Graneau discloses a method and apparatus (Figs 1-5) by which a high temperature superconductor can be cooled to a lower temperature easily and conveniently at a low cost (Col 1, lines 3-5 & 24-52). Specifically, with respect to claim 21, Graneau discloses a system (Figs 1-5) for transporting electric energy (Col 3, lines 30-35), comprising a superconducting cable (10 & 11, Fig 3) including superconducting material (Col 3, lines 40-42), and a cryogenic plant (17) for cooling said superconducting cable (12) below the critical temperature of said material (Col 3, lines 64-70), comprising a circuit (18, 19, &

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24) for circulating from and to the superconducting cable (10 & 11, Col 3, lines 55-65), a first refrigerating fluid (liquid nitrogen) having a first predetermined temperature lower than the critical temperature of the superconducting material (Col 4, lines 55-65), a refrigerating circuit (26) for cooling a second refrigerating fluid (neon gas) to a second predetermined temperature lower than the temperature of the first refrigerating fluid (liquid nitrogen, Col 4, lines 15-27), a heat exchange unit (33) for effecting a heat exchange between said first and second refrigerating fluids (liquefied nitrogen & neon gas, Col 4, lines 15-20), wherein the heat exchange unit (33) comprises a storage unit (25) of a third refrigerating fluid (cooled liquefied helium) having a third predetermined temperature lower than the temperature of the first- refrigerating fluid (liquefied helium), said third refrigerating fluid (cooled liquefied helium) being in heat exchange relationship with said first and second fluids (liquefied helium and neon gas) through pipes (46 & 44, Col 4, lines 5-30). With respect to claim 22, Graneau discloses that the storage unit (25) has a predetermined volume adapted to contain a quantity of said third refrigerating fluid (cooled liquefied helium) corresponding to the thermal consumption of said superconducting cable (10 & 11) for at least two hours in the absence of a heat exchange with said second refrigerating fluid (neon gas, Col 5, lines 58-70). With respect to claim 23, Graneau discloses that the refrigerating circuit (26) for cooling the second refrigerating fluid (neon gas) comprises at least one refrigerating unit (35) provided with at least one heat exchanger (36-38) in heat exchange relationship with said storage unit (25, Col 4, lines 14-20). With respect to claim 24, Graneau discloses that the refrigerating circuit (26) for cooling the second refrigerating fluid (neon gas)

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comprises at least one refrigerating unit (35) in heat exchange relationship with the storage unit (25) and with said first fluid (liquefied nitrogen, Col 4, lines 14-20), wherein the refrigerating unit (26) is positioned upstream of said superconducting cable (10 & 11) and the storage unit (25) is in parallel with said refrigerating unit (26, Fig 2). With respect to claim 25, Graneau discloses that the storage unit (25) comprises a storage tank (25) structurally independent from said refrigerating unit (26, Fig 2). With respect to claim 26, Graneau discloses that the heat exchange unit (33) further includes at least one heat exchanger (32) immersed in the third refrigerating fluid (cooled liquefied nitrogen) stored in said storage unit (inside 25), wherein said at least one heat exchanger (32) being provided with a fluid flow path for the tube side circulation of said first refrigerating fluid (liquefied nitrogen) by a circulating pipe (28). With respect to claim 27, Graneau discloses that the system (Fig 2) comprises an auxiliary circuit (27) for maintaining the third refrigerating fluid (cooled liquid nitrogen) at a predetermined temperature (Col 4, lines 1-5). With respect to claim 28, Graneau discloses that the auxiliary circuit (27) comprising at least one vacuum pump (24) connected to the storage unit (25) by means of ducts (28 & 31), wherein at least one heat exchanger unit (32) is interposed between the vacuum pump (24) and the heat exchanger unit (27, Fig 2). With respect to claim 29, Graneau discloses that the heat exchange unit (27) comprises at least one heat exchanger (not numbered) provided with a fluid flowpath (57 & 44) for circulating gas phase including vapors (neon gas) of the third refrigerating fluid (cooled liquefied nitrogen, Col 4, lines 14-20). With respect to claims 30-31, Graneau discloses that the system (Fig 2) further comprising container (inside 26) for

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storing the third refrigerating fluid (liquefied nitrogen) being selectively connected to the storage unit (25) of the heat exchange unit (33) by means of at least one duct (44).

With respect to claim 32, Graneau discloses that the first refrigerating fluid may be liquid nitrogen (Col 3, lines 55-56), which inherently has a temperature that is between 63 and 70K (Col 5, lines 68-70). With respect to claim 34, Graneau discloses that the third refrigerating fluid may be subcooled liquid nitrogen (Col 4, lines 71-75), which inherently has a temperature that is between 63 and 69K (Col 5, lines 68-70). With respect to claim 35, Graneau discloses a cryogenic plant (17) for transporting electric energy (Col 3, lines 30-35), comprising a superconducting cable (10 & 11, Fig 3) including superconducting material (Col 3, lines 40-42), and a cryogenic plant (17) for cooling said superconducting cable (12) below the critical temperature of said material (Col 3, lines 64-70), comprising a circuit (18, 19, & 24) for circulating from and to the superconducting cable (10 & 11, Col 3, lines 55-65), a first refrigerating fluid (liquid nitrogen) having a first predetermined temperature lower than the critical temperature of the superconducting material (Col 4, lines 55-65), a refrigerating circuit (26) for cooling a second refrigerating fluid (neon gas) to a second predetermined temperature lower than the temperature of the first refrigerating fluid (liquid nitrogen, Col 4, lines 15-27), a heat exchange unit (33) for effecting a heat exchange between said first and second refrigerating fluids (liquefied nitrogen & neon gas, Col 4, lines 15-20), wherein the heat exchange unit (33) comprises a storage unit (25) of a third refrigerating fluid (cooled liquefied helium) having a third predetermined temperature lower than the temperature of the first- refrigerating fluid (liquefied helium), said third refrigerating fluid (cooled

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liquefied helium) being in heat exchange relationship with said first and second fluids (liquefied helium and neon gas) through pipes (46 & 44, Col 4, lines 5-30). With respect to claim 36-37, Graneau discloses that the storage unit (25) has a predetermined volume adapted to contain a quantity of said third refrigerating fluid (cooled liquefied helium) corresponding to the thermal consumption of said superconducting cable (10 & 11) for at least two hours in the absence of a heat exchange with said second refrigerating fluid (neon gas, Col 5, lines 58-70). With respect to claim 40, Graneau discloses that a method for cooling in continuous a superconducting cable (10 & 11) including superconducting material below the critical temperature of said superconducting material (Col 3, lines 64-70), comprising the steps of circulating a first refrigerating fluid (liquefied nitrogen) from and to the superconducting cable (10 & 11), cooling the first refrigerating fluid to a first predetermined temperature by means of a second refrigerating fluid (neon gas) having a second predetermined temperature lower than the temperature of the first refrigerating fluid (liquefied nitrogen), wherein the cooling step of the first refrigerating fluid (liquefied nitrogen) is effected by means of the further steps of providing a cryogenic bath of a third refrigerating fluid (cooled liquefied nitrogen) in a storage area (25), cooling the third refrigerating fluid to a third predetermined temperature lower than the temperature of the first refrigerating fluid (liquefied nitrogen) by means of said second fluid (helium gas, Col 14, lines 8-17), cooling the first refrigerating fluid (liquefied nitrogen) by means of the third refrigerating fluid (cooled liquefied nitrogen) stored in the cryogenic bath (25, Cols 4-5, lines 55-75 & 1-14). With respect to claim 41, Graneau discloses that the third refrigerating fluid

(cooled liquefied nitrogen) is cooled to an intermediate temperature between the temperatures of the first and second refrigerating fluids (liquefied nitrogen and neon gas, Col 5, lines 29-70).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graneau (Pat Num 3,646,243) in view of Hildebrandt (Pat Num 3,932,158). Graneau discloses a method and apparatus (Figs 1-5) by which a high temperature superconductor can be cooled to a lower temperature easily and conveniently at a low cost (Col 1, lines 3-5 & 24-52). Specifically, with respect to claim 33, Graneau discloses that the second

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refrigerating fluid is gaseous neon (Col 4, lines 15-20), which has a pressure and has a second predetermined temperature that is between 40 and 55K (Col 5, lines 1-5).

However, Graneau doesn't necessarily disclose the second refrigerating fluid being helium (claim 33).

Hildebrant teaches an improved method and apparatus (Fig 1) for cooling a superconductive device, that may be a cable (Col 1, lines 13-22), which is cooling effective, operates at a lower cost and is less expensive (Col 2, lines 3-6). Specifically, with respect to claim 33, Hildebrant teaches that helium gas are commonly utilized to cool superconducting devices, that may be a cable (Col 1, lines 32-36), wherein Hildebrant further teaches that helium gas, which inherently has a pressure ranging between 1 and 20 bar, and has a second predetermined temperature that is between 40 and 55K is also utilized for cooling his superconducting device (Fig 1, Col 3, lines 15-37).

With respect to claim 33, it would have been obvious to one having ordinary skill in the art of cables at the time the invention was made to modify the system of Graneau to comprise the helium gas as taught by Hildebrant because Hildebrant teaches that such a material is commonly utilized to cool superconducting devices, that may be a cable (Col 1, lines 32-36), and is cooling effective, operates at a lower cost and is less expensive (Col 2, lines 3-6) and since it has been held to be within general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

7. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graneau (Pat Num 3,646,243). Graneau discloses a method and apparatus (Figs 1-5) by which a high temperature superconductor can be cooled to a lower temperature easily and conveniently at a low cost (Col 1, lines 3-5 & 24-52). With respect to claims 38-39, Graneau discloses that the storage unit (25) has a predetermined volume.

However, Graneau doesn't necessarily disclose the volume being 2000 liters (claim 38), nor the volume being 12000 liters (claim 39).

It would have been an obvious matter of design choice to modify the storage tank of Graneau to have a volume of 2000 liters or 12000 liters, since the applicant has not disclosed that such a modification solves any stated problems or is for any particular purpose and it appears that Graneau would perform equally well with the modification and since such a modification would have involved a mere change in size of a component and a change of size is generally recognized as being within the ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Response to Arguments

8. Applicant's arguments, filed October 24, 2003, with respect to the rejection(s) of claim(s) 21-41 under 35 USC 102(e) & 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

Conclusion

9. Based on the new rejection with respect to claims 21-41, this action is non-final.

Communication

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Mayo III whose telephone number is (703) 306-9061. The examiner can normally be reached on M-F 8:30am-6:00 pm (alternate Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (703) 308-3682. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



WHM III
December 28, 2003